

REMARKS

Favorable reconsideration, reexamination, and allowance of the present patent application are respectfully requested in view of the foregoing amendments and the following remarks. The foregoing amendments are necessary to correct a typographical error in the specification and in claim 10. It is clear that it is 'SEQ ID NO: 5' which is the full sequence of the gene encoding the Component A, B, and C of soluble-type MMO, since 'SEQ ID NO: 4' is a small probe which is used in PCR for isolating the larger gene segments. For example, paragraphs [0035] and [0066] correctly recite that SEQ ID Nos. 3 and 4 are used as primers in PCR. The specification incorrectly states in paragraph [0037] states 'DNA that is hybridizable with an open reading frame in the nucleotide sequence shown as SEQ ID NO: 4'. The recitation of 'SEQ ID NO: 4' in this context is clearly an error, and it is clear that the sequence being referred to as having a sequence hybridizable with an open reading frame should be 'SEQ ID NO: 5' since SEQ ID NO.4 is not an open reading frame, but a short PCR probe. Entry of the amendments is respectfully requested.

Amendments

Claim 10 is amended to correct a typographical error. Claims 1 and 8-10 are pending and under examination. It is asserted that the foregoing amendment is not new matter, since it is merely made to correct a typographical error as explained above. This amendment does not require any further search or consideration, as the patentability of the DNA comprising the component A, B, and C genes of soluble-type MMO has been previously considered in claim 1, and the addition of SEQ ID NO:5 in claim 10, which is dependent on claim 1, presents a further feature of such DNA. Therefore, entry of the foregoing amendment is respectfully requested.

Objection to the Claims

At page 2 of the Office Action, Claim 4 was objected to because it allegedly is of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant respectfully requests reconsideration of this objection.

It is unclear why this objection was made, as claim 4 is no longer pending.

For at least the foregoing reasons, Applicant respectfully withdrawal of this objection.

Rejection under 35 U.S.C. § 103(a)

In the Office Action, beginning at page 2, Claims 1 and 8-10 were rejected under 35 U.S.C. § 103(a), as reciting subject matters that allegedly are obvious, and therefore allegedly unpatentable, over the disclosure of Lloyd et al. in view of the disclosure of Stainthorpe et al. and West et al. Applicant respectfully requests reconsideration of this rejection.

The claims are directed to a method for culturing an *Escherichia coli* under particular conditions to produce an alcohol, wherein the bacteria express the recited genes. As stated previously, Lloyd et al. disclose a method for producing methanol from methane by using *M. trichosporium*. However, the claimed invention uses *E. coli*. Furthermore, although the optimal temperature for growth of *E. coli* is generally around 37°C, as described in paragraph [0072] of the specification, the method of the present invention requires culturing *E. coli* at a much lower temperature, that is, 20 to 30°C, in order to produce alcohol. Lloyd et al. clearly does not disclose or suggest culturing *E. coli* at 20 to 30°C so that alcohol can be produced. Therefore, this is not a mere choosing of culture conditions, but actually is a surprising effect of an unusual culture condition, given the optimum growth temperature for *E. coli*. Nothing in the prior art would lead one of ordinary skill in the art to choose these culture conditions, and in fact, teaches away from such. Therefore, the surprising effect is not taught or suggested by the prior art.

The secondary references do not make up for the deficiencies of Lloyd et al., and fail to provide a reason to combine the teachings of the three references to arrive at the claimed invention. In particular, the three components of methane oxygenase, that is, methane hydroxylase, B component, and reductase, are all required to be used in the method of the claimed invention. None of the cited documents disclose or suggest, either alone or in combination, that all three of these genes could be expressed in a microorganism, such as *E. coli*, that cannot originally assimilate an alkane and alcohol. The inventors of the present invention succeeded in simultaneous expressions of all the

genes for the first time, which imparted an ability to produce an alcohol from an alkane to the microorganism. The claimed invention has made it possible for the first time to impart an ability to produce alcohol from an alkane in the claimed microorganism. Therefore, the present invention is not obvious over these references.

Applicants continue to strenuously disagree with the assessment of the claimed process as a 'product-by-process' claim. Claim 1 has been amended to remove any implication of a product by process, in that the expression of the recited genes is now recited as a characteristic of the cell. The process of how the cell gained that characteristic, i.e. by transformation, is no longer present in the claim, and hence, the cell is not the claimed product of a claimed process. All characteristics of the cell must be considered as limitations of the claim for the purposes of evaluating the prior art.

For at least the foregoing reasons, Applicant respectfully submits that the subject matters of Claims 1 and 8-10, each taken as a whole, would not have been obvious to one of ordinary skill in the art at the time of Applicant's invention, are therefore not unpatentable under 35 U.S.C. § 103(a), and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 103(a).

Conclusion

For at least the foregoing reasons, Applicant respectfully submits that the present patent application is in condition for allowance. An early indication of the allowability of the present patent application is therefore respectfully solicited.

If Examiner Marx believes that a telephone conference with the undersigned would expedite passage of the present patent application to issue, she is invited to call on the number below.

It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and the Commissioner is hereby authorized to charge fees necessitated by this paper, and to credit all refunds and overpayments, to our Deposit Account 50-2821.

Respectfully submitted,

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